Volume 309 1996

Contents

Letters to the Editor

Dissociative recombination of H_2D^+ and the cosmic abundance of deuterium
Larsson M., Lepp S., Dalgarno A., Strömholm C., Sundström G., Zengin V., Danared H., Källberg A., af Ugglas M., Datz S. L1

The spatial structure of the Evershed effect
Wiehr E. L4

Anisotropy and inhomogeneity of the universe from $\Delta T/T$
Maartens R., Ellis G.F.R., Stoeger W.R. L7

Optical low states of the supersoft X-ray source RX J0513.9–6951
Reinsch K., van Teeseling A., Beuermann K., Abbott T.M.C. L11

The cosmic-ray positron-to-electron ratio in the energy range 0.85 to 14 GeV
Barbiellini G., Basini G., Bellotti R., Bocciolini M., Boezio M., Brancaccio F.M., Bravar U., Cafagna F., Candusso M., Carlson P., Casolino M., Castellano M., Circella M., Codino A., De Cataldo G., De Marzo C., De Pascale M.P., Finetti N., Francke T., Giglietto N., Golden R.L., Grimani C., Hof M., Marangelli B., Menn W., Mitchell J.W., Morselli A., Ormes J.F., Papini P., Perego A., Piccardi S., Picozza P., Ricci M., Schiavon P., Simon M., Sparvoli R., Spillantini P., Spinelli P., Stephens S.A., Stochaj S.J., Streitmatter R.E., Suffert M., Vacchi A., Weber N., Zampa N. L15

The radio lobes of Virgo A at 2.8 cm wavelength
Rottmann H., Mack K.-H., Klein U., Wielebinski R. L19

HS 2324+3944: discovery of non-radial pulsations in a hydrogen-rich PG 1159 star
Silvotti R. L23

Discovery of the C_8H radical
Cernicharo J., Guélin M. L27

Laboratory detection of the C_8H radical
McCarthy M.C., Travers M.J., Kovács A., Gottlieb C.A., Thaddeus P. L31

Detection of an extremely soft X-ray outburst in the H II-like nucleus of NGC 5905
Bade N., Komossa S., Dahlem M. L35

The distance of the Fornax cluster based on globular cluster luminosity functions
Kohle S., Kissler-Patig M., Hilker M., Richtler T., Infante L., Quintana H. L39

No CO emission from damped Lyman-α absorbers
Braine J., Downes D., Guilloteau S. L43

The cooling of the white dwarf in VW Hyi
Gänsicke B.T., Beuermann K. L47

The revised X-ray dividing line: new light on late stellar activity
Hünsch M., Schröder K.-P. L51

Cosmology

The determination of H_0 by using the TF relation: about particular selection effects
Triay R., Rauzy S., Lachièze-Rey M. 1

The reality of anomalous redshifts in the spectra of some QSOs and its implications
Burbidge G. 9

A morphological indicator for comparing simulated cosmological scenarios with observations
Lega E., Bijaoui A., Alimi J.M., Scholl H. 23

Anomalous redshifts in the spectra of extragalactic objects
Hoyle F., Burbidge G. 335

Extragalactic astronomy

Probing the halo of Centaurus A: a merger dynamical model for the PN population
Mathieu A., Dejonghe H., Hui X. 30

H I, H_2 and star formation in spiral galaxies in the region of the Coma supercluster
Casoli F., Dickey J., Kazès I., Boselli A., Gavazzi P., Baumgardt K. 43

Monitoring of the Einstein Cross with the Nordic Optical Telescope
Østensen R., Refsdal S., Stabell R., Teuber J., Emanuelsen P.I., Festin L., Florentin-Nielsen R., Gahm G., Gullbring E., Grundahl F., Hjorth J., Jablonski M., Jaunsen A.O., Kaas A.A., Karttunen H., Kotilainen J., Laurikainen E., Lindgren H., Mähönen P., Nilsson K., Olofsson G., Olsen Ø., Pettersen B.R., Piirola V., Sørensen A.N., Takalo L., Thomsen B., Valtaoja E., Vestergaard M., av Vianborg T. 59

Dynamical search for substructures in galaxy clusters. A hierarchical clustering method
Serna A., Gerbal D. 65

ROSAT observations of the radio galaxy B2 1122+39
Massaglia S., Trussoni E., Caucino S., Fanti R., Feretti L., Parma P., Brinkmann W. 75

X-ray properties of active galactic nuclei with optical Fe II emission
Wang T., Brinkmann W., Bergeron J. 81

Ca depletion and the presence of dust in large-scale nebulosities in radio galaxies. I
Villar-Martín M., Binette L. 97

The history of star formation of starburst galaxies
Coziol R. 345

Star formation in the Large Magellanic Cloud. II. Evidence for an old intermediate-age burst of stellar activity?
Vallenari A., Chiosi C., Bertelli G., Ortolani S. 358

Star formation in the Large Magellanic Cloud. III. A study of the regions LMC-30, LMC-45 and LMC-61
Vallenari A., Chiosi C., Bertelli G., Aparicio A., Ortolani S. 367

First millimeter mapping of the jet and nucleus of M 87
Despringre V., Fraix-Burnet D., Davoust E. 375

Self-consistent models of barred spiral galaxies
Kaufmann D.E., Contopoulos G. 381

Optical imaging and imaging spectroscopy of the peculiar spiral galaxy NGC 3310
Mulder P.S., van Driel W. 403

Stellar luminosity function as an age indicator for the dwarf spheroidal Leo I
Caputo F., Castellani V., Degl'Innocenti S. 413

(RN) A search for N^+ at $z = 3.8$
Ivison R.J., Harrison A.P. 416

BL Lacertae objects in the ROSAT All-Sky Survey: new objects and comparison of different search techniques
Nass P., Bade N., Kollgaard R.I., Laurent-Muehleisen S.A., Reimers D., Voges W. 419

Starburst activity in X-ray and FIR luminous galaxies: the case of NGC 4619 and IRAS 15564+6359
Mas-Hesse J.M., Cerviño M., Rodríguez-Pascual P.M., Boller T. 431

The spiral structure of M 51 from Hα and 2000 Å UV images. A new tracer of density waves
Petit H., Hua C.T., Bersier D., Courtès G. 446

Neutral hydrogen in the nearby galaxies Dwingeloo 1 and Dwingeloo 2
Burton W.B., Verheijen M.A.W., Kraan-Korteweg R.C., Henning P.A. 687

(RN) SBS 1425+606: a bright, high-redshift QSO. Illuminating a damped Lyα absorber
Stepanlan J.A., Chavushian V.H., Chaffee F.H., Foltz C.B., Green R.F. 702

Molecular distribution and kinematics in nearby galaxies. II. Sub-mm observations of NGC 4945
Mauersberger R., Henkel C., Whiteoak J.B., Chin Y.-N., Tieftrunk A.R. 705

Signatures of the vertical structure of stellar disks in colour profiles of edge-on galaxies
Just A., Fuchs B., Wielen R. 715

A giant low-ionization nebula associated with a radio galaxy in a forming cluster at $z = 0.79$
Giraud E., Melnick J., Krishna G., Mendes de Oliveira C., Kulkarni V.K. 733

(RN) Heavy-element abundances in normal spiral galaxies
Rodríguez-Quintero J., Lozano M. 743

The fundamental plane of early-type galaxies: stellar populations and mass-to-light ratio
Prugniel P., Simien F. 749

Galactic structure and dynamics

The structure of the interstellar gas towards stars in the globular cluster M 10
Kennedy D.C., Bates B., Kemp S.N. 109

Evolution of the carbon and oxygen isotopes in the Galaxy
Prantzos N., Aubert O., Audouze J. 760

Stellar clusters and associations

ROSAT observations of ten globular clusters with large core radii
Johnston H.M., Verbunt F., Hasinger G. 116

Search for CO emission in globular clusters
Leon S., Combes F. 123

Interplay and escape in three-body scattering
Shebalin J.V., Tippens A.L. 459

Formation, structure and evolution of stars

Combined stellar structure and atmosphere models for massive stars. Wolf–Rayet models with spherically outflowing envelopes
Schaerer D. 129

(RN) The problem of the pulsation of the Cepheid CO Aurigae
Antonello E., Kanbur S.M., McArthur G.K. 144

The SU Ursa Majoris star CU Velorum: physical parameters, Doppler imaging and photometric time series
Mennickent R.E., Diaz M. 147

Infall in Herbig Ae/Be stars: what Na D lines tell us
Sorelli C., Grinin V.P., Natta A. 155

New binary stars discovered by lunar occultations. II
Richichi A., Calamai G., Leinert C., Stecklum B., Trunkovsky E.M. 163

On cooling of magnetized neutron stars
Shibanov Y.A., Yakovlev D.G. 171

Population synthesis of high-mass binaries
Portegies Zwart S.F., Verbunt F. 179

The δ Scuti star FG Virginis. II. A search for high pulsation frequencies
Breger M., Handler G., Serkowitsch E., Reegen P., Provencal J., Wood M.A., Clemens J.C., O'Brien M.S., Winget D.E., Nather R.E., Kleinman S.J., Kanaan A., Watson T.K., Montgomery M.H., Bradley P.A., Sullivan D.J., Leibowitz E., Mendelson H., Krzesinski J., Pajdosz G., Moskalik P., Solheim J.-E. 197

Amplification of neutron star magnetic fields by thermoelectric effects. VI. Analytical approach
Wiebicke H.-J., Geppert U. 203

(RN) Mass loss in metal-deficient red giants
Castellani V., Romaniello M. 213

(RN) Rotational velocity for lithium-rich evolved stars
De Medeiros J.R., Melo C.H.F., Mayor M. 465

The observability of old neutron stars accreting the interstellar medium. III. The solar vicinity
Zane S., Zampieri L., Turolla R., Treves A. 469

The β Pictoris phenomenon among young stars. III. The Herbig Ae stars WW Vulpeculae, RR Tauris and BF Orionis
Grinin V.P., Kozlova O.V., Thé P.S., Rostopchina A.N. 474

Emission properties of pulsars at mm-wavelengths
Xilouris K.M., Kramer M., Jessner A., Wielebinski R., Timofeev M. 481

Dust and gas distribution around T Tauri stars in Taurus-Auriga. I. Interferometric 2.7 mm continuum and ^{13}CO J = 1–0 observations
Dutrey A., Guilloteau S., Duvert G., Prato L., Simon M., Schuster K., Ménard F. 493

R 4 in the Small Magellanic Cloud: a spectroscopic binary with a B[e]/LBV-type component
Zickgraf F.-J., Kovács J., Wolf B., Stahl O., Kaufer A., Appenzeller I. 505

A model for pulsar nullings
Kazbegi A., Machabeli G., Melikidze G., Shukre C. 515

Spectroscopic orbit of the triple star 55 Ursae Majoris
Horn J., Kubát J., Harmanec P., Koubský P., Hadrava P., Šimon V., Štefl S., Škoda P. 521

(RN) Possible change of the orbital period of the nova-like binary V Sagittae
Šimon V. 775

(RN) Infrared lines for measuring the magnetic field strength of T Tauri stars
Guenther E.W., Emerson J.P. 777

On the origin of the iron line in GS 2023+338
Oosterbroek T., van der Klis M., Vaughan B., van Paradijs J., Rutledge R., Lewin W.H.G., Tanaka Y., Nagase F., Dotani T., Mitsuda K., Yoshida K. 781

Rapid photometric and spectroscopic variability of the Be star DX Eridani
Štefl S., Balona L.A. 787

MWC 560: a view from the near-infrared
Zhekov S.A., Hunt L.K., Tomov T., Gennari S. 800

The remarkable Herbig Ae star V 351 Orionis = HD 38238
van den Ancker M.E., Thé P.S., de Winter D. 809

Discovery and analysis of a hydrogen-rich PG 1159 star
Dreizler S., Werner K., Heber U., Engels D. 820

An evolutionary diagram for young stellar objects
Saraceno P., André P., Ceccarelli C., Griffin M., Molinari S. 827

Stellar atmospheres

Photoionization resonances of Si II in stellar spectra
Lanz T., Artru M.-C., Le Dourneuf M., Hubeny I. 218

Observation of flux and circular polarization spectra of white dwarfs with low magnetic fields
Friedrich S., Östreicher R., Schweizer W. 227

Optimal inference of episodic stellar mass-loss rates from real polarimetric and absorption data with noise and sparse sampling
Calvini P., Bertero M., Brown J.C. 235

Hα spectroscopy of the chromospherically active binary HR 1099 in 1993
Zhai D.S., Zhang X.B. 530

The infrared and radio continuum of early-type stars
Runacres M.C., Blomme R. 544

The interesting problem of the NLTE nitrogen abundance in Vega
Lemke M., Venn K.A. 558

Radiative line transfer in overlapping doublets
Rons N. 840

Stellar far-IR fluxes: how accurate are model predictions?
van der Bliek N.S., Gustafsson B., Eriksson K. 849

Search for trace amounts of hydrogen in hot DO white dwarfs
Werner K. 861

The fading of radiatively driven winds in B stars
Babel J. 867

Effective temperature of A and F stars from Balmer line profiles, and the infrared flux method. I. Two Am stars: the Sun and Procyon as standards
van 't Veer-Menneret C., Mégessier C. 879

Diffuse matter in space (including H II regions and planetary nebulae)

Local correlations of the fluctuations at different scales of the 60 and 100 μm emissions of a high galactic latitude complex
Abergel A., Boulanger F., Delouis J.M., Dudziak G., Steindling S. 245

What are the true astronomical silicates?
Greenberg J.M., Li A. 258

The magnetic field structure around protostars. Submillimetre polarimetry of VLA 1623 and S 106-IR/FIR
Holland W.S., Greaves J.S., Ward-Thompson D., André P. 267

Near-infrared surface brightness observations of the Thumbprint Nebula and determination of the albedo of interstellar grains
Lehtinen K., Mattila K. 570

The structure of the IC 1396 region
Weikard H., Wouterloot J.G.A., Castets A., Winnewisser G., Sugitani K. 581

Mid-infrared spectroscopy of carbon-rich post-AGB objects and detection of the PAH molecule chrysene
Justtanont K., Barlow M.J., Skinner C.J., Roche P.F., Aitken D.K., Smith C.H. 612

He 2–104 revisited
de Freitas Pacheco J.A., Costa R.D.D. 629

Discovery of solid formaldehyde toward the protostar GL 2136: observations and laboratory simulation
Schutte W.A., Gerakines P.A., Geballe T.R., van Dishoeck E.F., Greenberg J.M. 633

Modelling the X-ray, EUV and infrared coronal-line emission from PNe
Zhekov S.A., Perinotto M. 648

(RN) Is the expanding molecular cloud surrounding λ Orionis caused by a Supernova?
Cunha K., Smith V.V. 892

HST observations of the PG 1159-type central star of K 1–16
Patriarchi P., Perinotto M. 895

Physical and chemical structure of the IC 63 nebula. III. Gas-phase carbon abundance
Jansen D.J., van Dishoeck E.F., Keene J., Boreiko R.T., Betz A.L. 899

Modelling the structure of selected planetary nebulae
Gesicki K., Acker A., Szczerba R. 907

On the emissivity of π^0-decay gamma radiation in the vicinity of accelerators of galactic cosmic rays
Aharonian F.A., Atoyan A.M. 917

Echelle spectroscopy of shocked H_2 in the L 1448 outflow
Davis C.J., Smith M.D. 929

The Sun

Cloud model with variable source function for solar Hα structures
Mein N., Mein P., Heinzel P., Vial J.-C., Malherbe J.M., Staiger J. 275

Spatial changes of the oscillatory pattern in sunspot penumbrae at the photospheric level
Marco E., Aballe Villero M.A., Vázquez M., García de la Rosa J.I. 284

Metric spikes and electron acceleration in the solar corona
Benz A.O., Csillaghy A., Aschwanden M.J. 291

He I λ 10830 Å line as an indicator of solar chromospheric activity
Shcherbakov A.G., Shcherbakova Z.A., Tuominen I., Jetsu L. 655

Full-field wavefront measurements with phase diversity
Acton D.S., Soltau D., Schmidt W. 661

Further improvement of the solar model
Gabriel M. 939

A steady flow model for quiescent prominences
Del Zanna L., Hood A.W. 943

The solar system

Global evolution of solid matter in turbulent protoplanetary disks. I. Aerodynamics of solid particles
Stepinski T.F., Valageas P. 301

(RN) A self-consistent theory of MHD parametric instabilities driven by a standing Alfvén wave in the planetary magnetosphere
Chian A.C.-L., Oliveira L.P.L. 673

(RN) Precise flux density determination of 1 Ceres with the Heinrich-Hertz-Telescope at 250 GHz
Altenhoff W.J., Baars J.W.M., Schraml J.B., Stumpff P., von Kap-herr A. 953

H Lyman alpha transport in the heliosphere based on an expansion into scattering hierarchies
Scherer H., Fahr H.J. 957

A new model of the asteroid 532 Herculina
Michalowski T. 970

Celestial mechanics and astrometry

Correlation of the astrometric latitude residuals at Mizusawa and Tokyo with the southern oscillation index on an interannual time scale
Li Z.X. 313

Physical and chemical processes

Impact polarization of the Hα line of hydrogen in solar flares: calculations of electron and proton collisional anisotropic processes between the Zeeman excited sublevels
Sahal-Bréchot S., Vogt E., Thoraval S., Diedhiou I. 317

Atomic data from the IRON Project. XIV. Electron impact excitation of the Fe XIV fine-structure transition $^2P^o_{1/2}$–$^2P^o_{3/2}$
Storey P.J., Mason H.E., Saraph H.E. 677

Momentum transfer in photoionization of one-electron ions
Massacrier G. 979

Theoretical radiative lifetimes for the $3p^3(^4S^0)4s\ ^5S^0$ and $^3S^0$ states in S I
Biémont E., Storey P.J., Zeippen C.J. 991

Collimated magnetostatic fields
Lovelace R.V.E., Boily C.M. 997

Limits on diffusive shock acceleration in dense and incompletely ionised media
O'C Drury L., Duffy P., Kirk J.G. 1002

Preview of accepted papers (April 1996) 683

Abstracts of articles which have been published in A&A Supplement Series 116, No. 2 1011

A $^{12}CO(1–0)$ survey of spiral galaxies in the region of the Coma supercluster
Casoli F., Dickey J., Kazès I., Boselli A., Gavazzi G., Jore K. 1011

Structure and kinematics of galaxy clusters. I. The redshift catalogue
Stein P. 1011

Time variability of five strong 12 GHz methanol masers
Moscadelli L., Catarzi M. 1011

A library of *H* band stellar spectra for stellar population analysis purposes
Dallier R., Boisson C., Joly M. 1012

New abundances of southern planetary nebulae
Costa R.D.D., Chiappini C., Maciel W.J., de Freitas Pacheco J.A. 1012

Long- and short-term variability in O-star winds. I. Time series of UV spectra for 10 bright O stars
Kaper L., Henrichs H.F., Nichols J.S., Snoek L.C., Volten H., Zwarthoed G.A.A. 1012

CCD photometry and long-term optical variability of PKS 2155–304
Zhang Y.H., Xie G.Z. 1012

Redshift of southern radio galaxies
Scarpa R., Falomo R., Pesce J.E. 1013

Stars of the southern hemisphere proposed for the Hipparcos mission
Rousseau J.M., Périé J.P., Gachard M.T. 1013

Atlas of high-resolution emission and shell lines in Be stars. Line profiles and short-term variability
Hanuschik R.W., Hummel W., Sutorius E., Dietle O., Thimm G. 1013

Stark broadening of Xe II lines
Popović L.Č., Dimitrijević M.S. 1013

Detection of scattered light in telescopes
Grundahl F., Sørensen A.N. 1014

Global astrometry with OSI
Loiseau S., Malbet F. 1014

Interferometric connection of large ground-based telescopes
Mariotti J.-M., Coudé du Foresto V., Perrin G., Zhao P., Léna P. 1014

Classification of planetary nebulae by cluster analysis and artificial neural networks
Faúndez-Abans M., Ormeño M.I., de Oliveira-Abans M. 1014

Abstracts of articles which have been published in A&A Supplement Series 116, No. 3 1015

VRI photometry of stars in the fields of 12 BL Lacertae objects
Fiorucci M., Tosti G. 1015

The relativistic beaming model for active galactic nuclei
Fan J.H., Xie G.Z., Wen S.L. 1015

Tidally-triggered disk thickening. I. Observations
Reshetnikov V., Combes F. 1015

Morphological classification and structural parameters for early-type galaxies in the Coma cluster
Andreon S., Davoust E., Michard R., Nieto J.-L., Poulain P. 1015

The ellipticities of globular clusters in the Andromeda galaxy
Staneva A., Spassova N., Golev V. 1016

Apsidal motion in the eclipsing binary AS Camelopardalis
Wolf M., Šarounová L., Diethelm R. 1016

Spectroscopy of possible Hα emission stars in regions of high galactic latitude molecular clouds
Martín E.L., Kun M. 1016

Precise modeling of nutation and VLBI observations
Souchay J., Feissel M., Ma C. 1016

The chemical composition towards the Galactic anti-centre. I. Observations and model atmosphere analyses
Smartt S.J., Dufton P.L., Rolleston W.R.J. 1017

Optical positions of radio stars. I
Hui H., Dongming L. 1017

Cepheids and binarity. II. Radial velocities and spectroscopic orbits of four galactic Cepheids: RX Camelopardalis, MW Cygni, Z Lacertae and U Vulpeculae *(Text in French)*
Imbert M. 1017

Surface photometry of binary galaxies. I. A multicolour study of morphologies due to the interaction
Reduzzi L., Rampazzo R. 1017

Transition probabilities for forbidden lines of Fe III
Quinet P. 1018

GAIA: Global astrometric interferometer for astrophysics
Lindegren L., Perryman M.A.C. 1018

Diffraction-limited near-infrared imaging of the Red Rectangle by bispectral analysis
Cruzalèbes P., Tessier E., Lopez B., Eckart A., Tiphène D. 1018